HUMAN CAPITAL AND INCLUSIVE GROWTH IN SUB-SAHARAN AFRICA: THE CASE FOR HEALTH

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ABSTRACT
This paper employs the Pooled Mean Group (PMG) technique to investigate the nexus between human capital development and inclusive growth across 20 sub-Saharan African (SSA) countries from 2000 to 2021. The results reveal that human capital development indicators positively influence the inclusive growth index in both the short and long run, except for public health expenditure, which shows a significant negative impact. The study finds that economic adjustments toward equilibrium occur within a year, as indicated by the error correction mechanism. Policy recommendations include increasing government spending on health, improving citizen empowerment, reducing corruption, and upholding the rule of law to ensure life expectancy translates into equitable growth.
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1 INTRODUCTION
Inclusive growth seeks to ensure that the benefits of economic development are widely shared, particularly by engaging disadvantaged and vulnerable populations in productive activities. The goal of inclusive growth is to maximize collective well-being and provide equitable access to opportunities, emphasizing the need for broad participation in economic processes (Bello et al., 2023; Danladi et al., 2023; Kwilinski et al., 2023; Sugiawan et al., 2023). Over time, key indicators of inclusive growth –such as employment growth, access to education and healthcare, and income distribution – have evolved to reflect a more comprehensive view of economic development. These indicators reveal persistent gaps in income and opportunity, particularly in regions like Sub-Saharan Africa (SSA), where high levels of exclusion continue to hinder progress toward inclusive growth (Mahendra Dev, 2018; Wang et al., 2013).
The disparities in SSA are most evident in persistent challenges such as low employment growth, limited agricultural development, wide rural-urban divides, gender and social inequalities, and the unequal distribution of economic benefits, including income and wealth (Mahendra Dev, 2018). Moreover, low levels of human capital investment – especially in education and healthcare – have exacerbated these inequalities. As human capital is a critical driver of labor productivity, any deficiencies in this area directly limit both individual income and broader economic development. Thus, human capital development becomes a key focus in efforts to promote inclusive growth, as it directly influences productivity and earnings, which

are crucial for improving welfare (Diener & Seligman, 2004; Friedman, 2014; Holtom et al., 2006).

Human capital investment, including in healthcare and education, has been linked to higher labor productivity, which in turn increases income levels and enhances overall welfare (Diener & Seligman, 2004; Holtom et al., 2006). For instance, spending on healthcare is considered an investment in human capital, as it leads to healthier workers who can engage in more productive work, thereby boosting lifetime earnings (Friedman, 2014). This relationship has become increasingly important in SSA, where addressing deficits in health and education is seen as a fundamental aspect of achieving inclusive growth (Taekman & Shelley, 2023). However, despite these established connections, the region has made limited progress in improving key indicators of human capital. For example, the Human Capital Index (HCI) remains relatively low in SSA, with many countries showing little improvement in the past two decades. The HCI scores for countries like Nigeria, Tanzania, and Zambia have stagnated or slightly declined, indicating that efforts to improve human capital have not yielded substantial results (World Bank, 2023).

The sluggish improvement in human capital in SSA has been accompanied by slow growth in inclusive economic indicators, such as GDP per person employed, a crucial measure of inclusive growth. This indicator reflects the extent to which economic growth is translated into higher productivity for the working population. In SSA, trends in GDP per person employed show significant fluctuations, often declining in countries like Nigeria, South Africa, and Botswana, where economic growth has not consistently resulted in increased income for the majority (World Development Indicators [WDI], 2022). This suggests that, despite some progress in economic development, growth in SSA has not been sufficiently inclusive.

While the relationship between human capital development and economic growth has been widely studied, there has been limited focus on how human capital affects inclusive growth, especially with respect to health-related human capital. Previous research has examined health human capital primarily through indirect measures such as public health expenditure and life expectancy (Boussalem et al., 2014; Edeme et al., 2017; Kolawole, 2016; Metu, 2021). These studies suggest that investments in public health can enhance life expectancy, which is linked to improved labour productivity and overall economic outcomes. However, there is a gap in the literature regarding the direct impact of health human capital on inclusive growth, particularly in SSA.

This study seeks to fill this gap by examining the effect of health human capital development on inclusive growth in SSA. Specifically, it will use life expectancy at birth and public expenditure on health as indicators of health human capital and control for other factors that may influence economic outcomes, such as capital stock (measured by gross capital formation), the rule of law, and control of corruption. By focusing on the health dimension of human capital, this study aims to provide a clearer understanding of how investments in health can drive inclusive economic growth in SSA.

The rest of the paper is organised in the following order: Section 2 presents the literature review; Section 3 describes the methodology cum theoretical issue; Section 4 provides details of empirical results and discussion therefrom; and finally, Section 5 concludes the paper.

2 LITERATURE REVIEW

2.1 Theoretical Issues

A comprehensive theoretical framework for understanding the relationship between human capital and inclusive growth emerges from the perspectives of Lin (2004), Hausmann et al. (2005), and Ali and Son (2007). While each author offers a distinct approach, their theories converge on the idea that fostering human capital is integral to both economic transformation

and social equity. Empirical research further supports these theoretical insights, demonstrating the critical role of human capital in driving inclusive growth.

Lin (2004) emphasizes the importance of adopting appropriate development strategies, specifically the comparative advantage defying (CAD) and comparative advantage following (CAF) strategies. He argues that developing countries often fail to implement effective strategies that would allow them to achieve both dynamic growth and equitable income distribution. By leveraging the "advantage of backwardness," Lin suggests that countries can fast-track their economic development by borrowing technology and industrial knowledge from advanced nations, thus fostering innovation and diversifying into high-value industries. In this framework, human capital becomes crucial as it enables nations to absorb new technologies, enhance productivity, and move into higher-skilled sectors. Empirical studies support Lin's theory, showing that countries that invest in education and skills development are better positioned to transition from low to high-productivity industries. For instance, studies by Acemoglu and Robinson (2012) demonstrate that countries that adopt innovation-driven growth strategies, often reliant on high human capital, experience faster economic growth and more inclusive development outcomes. Similarly, research by Bils and Klenow (2000) shows that human capital accumulation, particularly through education, plays a pivotal role in explaining cross-country variations in income levels and economic growth.

Building on the need for strategic reform, Hausmann et al. (2005) propose the concept of growth diagnostics, which aims to identify and address the binding constraints hindering economic growth. One of the key constraints identified is human capital deficiencies, which can significantly limit a country's ability to reach its growth potential. According to Hausmann et al., eliminating distortions such as market failures, inadequate education systems, and weak health care infrastructure can unlock higher growth rates and, in turn, improve living standards. This is corroborated by empirical evidence, such as the World Bank's (2013) report on the importance of human capital in developing economies. The report highlights those countries with a well-educated and healthy workforce tend to have higher rates of productivity growth and are better able to respond to economic challenges. Hausmann et al.'s framework also aligns with research by Pritchett (2001), who argues that investments in education and health are crucial for overcoming growth constraints, particularly in low-income countries where human capital shortages are a significant barrier to sustained growth.

Ali and Son (2007) provide an important complement to the previous frameworks by focusing specifically on inclusive growth, which is not only about increasing national income but also ensuring that the benefits of growth are equitably distributed across society. Their concept of a social opportunity function underscores the need for policies that enhance both the quantity and quality of employment. For Ali and Son, inclusive growth requires investments in dynamic sectors capable of absorbing and upgrading the skills of the labour force. Empirical studies, such as those by Dollar and Kraay (2002), show that inclusive growth – defined by reductions in income inequality and broader access to economic opportunities – can significantly contribute to long-term poverty reduction. Furthermore, studies by Behrman et al. (2013) suggest that human capital investments, particularly in education and health, are crucial for reducing income inequality and improving social mobility. The emphasis on job quality – defined by decent wages, job security, and social protection – is as important as job quantity, aligning with evidence from the International Labour Organization (ILO, 2015), which demonstrates that improving job quality can have a direct impact on both economic productivity and social stability.

Human capital plays a dual role here: it not only helps individuals move into higher-wage jobs but also ensures that the broader economy benefits from a more educated and skilled workforce, which can contribute to reducing inequalities. Their framework recognizes the tension between expanding opportunities and addressing inequality, with human capital serving as a tool to

mitigate disparities in education, health, and access to decent employment. This dual impact is consistent with the findings of Banerjee and Duflo (2019), who emphasize that expanding access to education and health services can reduce inequality and foster more inclusive development. Moreover, their work highlights the importance of addressing both supply-side (skills development) and demand-side (quality employment opportunities) factors to create truly inclusive growth pathways.

When synthesized, these perspectives illustrate that human capital is at the heart of achieving inclusive growth. Lin's focus on leveraging strategic development and innovation underscores the importance of human capital in creating dynamic industries. Hausmann et al.'s growth diagnostics emphasize the need to address human capital deficits as a core constraint to economic growth, while Ali and Son's emphasis on inclusive growth points to the necessity of improving the quality of jobs and fostering social mobility through human capital investments. The empirical evidence consistently supports the idea that countries investing in education, health, and skills development are more likely to achieve higher, more inclusive rates of economic growth.

Human capital is not just a driver of economic growth but also a crucial lever for ensuring that the benefits of growth are widely shared, fostering a more inclusive and sustainable development path. Studies by OECD (2018) and World Bank (2020) underline the importance of human capital development in reducing income inequality, improving social outcomes, and creating the conditions for a more equitable society.

2.2 Empirical Review

The link between human capital development and inclusive growth has been a focal point of empirical research, with significant variation across regions such as Sub-Saharan Africa (SSA), Europe, OECD countries, Asian Tigers, and emerging market economies (EMEs). While there is a broad consensus on the positive relationship between human capital – especially health and education – and economic growth, the dynamics in Sub-Saharan Africa present unique challenges and opportunities when compared to more developed and rapidly growing economies.

In Sub-Saharan Africa, human capital development has been widely acknowledged as a critical factor for fostering inclusive growth. Tella (2016) explored the role of health and population growth on inclusive growth across 14 African countries from 1995 to 2012. The study found that adequate financing of the health sector had a profound impact on the inclusiveness of growth, suggesting that SSA nations must prioritize healthcare investments to drive pro-poor growth. Kolawole (2016) extended this argument in the context of Nigeria, demonstrating that government expenditure on health was positively associated with long-term inclusive growth. Similarly, Raheem (2018) found that increased public spending on health in 18 SSA nations led to enhanced GDP per capita growth, underscoring the importance of health sector financing for promoting equitable economic development in the region.

However, the human capital challenges in SSA remain daunting, largely due to a combination of high disease burdens, insufficient healthcare infrastructure, and limited access to quality education. For instance, while SSA countries have made strides in expanding access to healthcare, issues such as malnutrition, HIV/AIDS, and malaria continue to undermine the health status of the population, thus inhibiting potential economic gains (Chhetri, 2017). These health challenges exacerbate poverty and inequality, making it difficult for the region to achieve sustainable and inclusive growth. Furthermore, the limited human capital development in SSA results in a low-skilled labour force, which hinders productivity and industrial diversification, both of which are essential for economic growth (Owusu-Antwi, 2020). As such, addressing the gaps in healthcare and education is imperative for SSA countries to unlock the full potential of their human capital.

Comparing these findings with developed economies, particularly those within the OECD, highlights stark differences in the role of human capital in driving economic growth. OECD countries such as the United States, Germany, and France have long benefited from well-established healthcare and education systems. Barro (1996) and Aghion (2010) found that life expectancy, a key indicator of health, has a positive and significant impact on economic growth in these developed nations. Barro's (1996) analysis showed that life expectancy at birth is strongly correlated with per capita GDP growth in OECD countries, reinforcing the view that a healthy workforce is essential for sustaining high levels of productivity and economic output. Aghion (2010) further extended this argument, emphasizing that improvements in health status contribute significantly to enhancing labour productivity and income growth in developed economies. The positive effects of health improvements in OECD countries are largely attributed to the availability of advanced healthcare systems, which reduce mortality rates, increase life expectancy, and, ultimately, improve the productivity of the labour force (James, 2017). This stands in contrast to SSA, where health infrastructure is underdeveloped, and access to healthcare is still limited, especially in rural and marginalized areas (Kolawole, 2016).

The experiences of the Asian Tigers – Hong Kong, Singapore, South Korea, and Taiwan – offer additional insights into the role of human capital in fostering inclusive growth. These economies have demonstrated that significant investments in education and healthcare can create a highly skilled and healthy labour force capable of driving sustained economic growth. For instance, South Korea's transformation from a war-torn nation into one of the world's largest economies can largely be attributed to its focus on education and healthcare (Chhetri, 2017; Lee & Yuan, 2024; Shroff et al., 2024). The government's heavy investments in these sectors over several decades have led to an educated and productive workforce, driving both innovation and industrialization. Similarly, Singapore's investments in healthcare have not only improved the life expectancy of its population but have also contributed to creating a productive labour force, which has been central to its rapid economic development (Aghion, 2010). The Asian Tigers' experiences demonstrate that strategic human capital development, particularly in health and education, can significantly accelerate inclusive growth and reduce inequality in the long run.

Furthermore, China and India have similarly prioritized human capital development as a key driver of economic growth. Aghion (2010) argued that both nations have seen substantial gains in economic growth partly due to improvements in health and education. In China, for instance, government spending on healthcare and education has facilitated a dramatic reduction in poverty and a significant increase in human capital, leading to higher labour force participation and productivity growth (Ravallion, 2020). India, too, has benefited from increased investments in education and health, which have supported its shift from an agrarian economy to a service-based economy (Chhetri, 2017). These countries highlight the importance of investing in basic health and education infrastructure to foster inclusive growth, which is a crucial lesson for SSA. While the pace of human capital development in SSA may differ from that of the Asian Tigers or EMEs, the fundamental role of human capital in fostering inclusive growth remains undeniable.

Despite the evidence from OECD countries, the Asian Tigers, and EMEs, SSA faces specific challenges that require tailored policy responses. One key difference lies in the availability of resources for funding health and education. While countries in Asia and Europe benefit from higher income levels, tax revenues, and international aid, SSA faces significant financing gaps in public services, including health and education (Raheem, 2018). In this context, the potential for using natural resource rents or foreign aid to finance human capital development could play a pivotal role in SSA's development trajectory (Kolawole, 2016). Additionally, SSA must not only invest in healthcare and education but also address issues related to governance, healthcare

delivery systems, and the quality of education to ensure that human capital investments lead to measurable improvements in labour productivity and economic outcomes.

In conclusion, the empirical literature demonstrates that human capital – especially health and education – plays a pivotal role in promoting inclusive growth. For Sub-Saharan Africa (SSA), human capital development has proven to be an essential yet undercapitalized factor in achieving sustainable economic growth. Evidence from the OECD, Asian Tigers, and emerging market economies demonstrates the positive correlation between human capital investments and economic development, but the challenges in SSA remain substantial due to limited infrastructure, financing gaps, and social inequalities. The experiences of advanced economies show that strategic investments in health and education are pivotal in improving labour productivity, reducing poverty, and driving inclusive growth. Similarly, emerging markets like China and India provide valuable lessons on how prioritizing human capital development, particularly in health and education, has been central to their economic success.

However, the unique context of SSA – characterized by significant health burdens, educational deficits, and constrained fiscal resources – necessitates tailored policies and innovative approaches. As such, the literature underscores the need for increased public and private investment in health and education, alongside the strengthening of governance and healthcare delivery systems. Despite these advances, significant gaps remain in understanding the intricate relationship between human capital development and inclusive growth in SSA. There is a clear research gap in examining how specific factors, such as governance quality, political stability, and international aid, influence the outcomes of human capital investments in SSA. Furthermore, while much of the existing literature focuses on the direct effects of human capital on growth, there is limited exploration of the mechanisms through which these investments can be translated into broader economic benefits, particularly in the context of fragile states and low-income economies.

Future research could benefit from exploring these unexamined dimensions, especially with the changing global context – where the digital transformation and shifting demographic trends are creating both challenges and opportunities for human capital development. Additionally, comparative studies that go beyond the traditional development paradigms, incorporating SSA-specific variables like informal labour markets, migration patterns, and health system resilience, could provide deeper insights into how to unlock inclusive growth in the region. These gaps present exciting opportunities for future empirical research, which could inform policy design and strategic interventions to foster inclusive growth in SSA and similar developing regions.

3 METHODOLOGY

3.1 Model Specification

The model for this study is based on the Lin (2004) inclusive growth theory, which emphasizes the role of government in determining the type of development strategy that will help achieve inclusive growth. It explains that firms should produce using the least cost technology by making use of factor endowments such as labour for which many developing countries have a comparative advantage. It also promotes favourable international trade and the role of quality institutions.

The inclusive growth model is therefore presented as a function of the labour force participation rate (LFP), trade openness (TO) and the quality of institutions captured using control of corruption (CC) and rule of law (RL). Inclusive growth (IG) is measured using the inclusive growth index (IGI).

$$ig_{it} = f\left(lfpr_{it}, to_{it}, cc_{it}, rl_{it}\right) \quad (1)$$

The effect of health human capital development was captured using life expectancy at birth (LEB) and public expenditure on health (PEH). The study also controlled for capital stock using the gross capital formation (GFCF). The model therefore becomes:

$$ig_{it} = \delta_0 + \delta_1 lfpr_{it} + \delta_2 to_{it} + \delta_3 leb_{it} + \delta_4 peh_{it} + \delta_5 gfcf_{it} + \delta_6 cc_{it} + \delta_7 rl_{it} + \varepsilon_t \qquad (2)$$

To empirically estimate equation (2), the panel Autoregressive Distributed Lag (PARDL) approach is employed in order to validated the human capital-inclusive growth nexus in SSA countries. Since the variables deployed are characterised by large cross-sectional units (N) and time series (T), the non-stationary heterogeneous panel is considered appropriate, as it enables us to capture the various characteristics of studied countries by estimating various short-run and long-run dynamics in the relationship between human capital and inclusive growth, such that the specifications regarding cross-sectional slope coefficients are easily accommodated. More so, the Pooled Mean Group (PMG) estimator proposed by Pesaran et al. (1999) is favoured over other competing estimator – Mean Group (MG) estimator. The attraction to the former is premised on an intermediate estimator that allows the short-term parameters to differ between groups while imposing equality of the long-term coefficients between groups (Bangake & Eggoh, 2012). This selection is further premised on its flexibility and capacity to account for more heterogeneous dynamics in the slope coefficients completely.

Thus, we specify the generic representation of PARDL, enabling the capturing of the dynamic heterogeneity of human capital and inclusive growth of the examined 20 SSA countries below.

$$igi_{it} = \sum_{k=1}^{r} \alpha_{1ik} igi_{i,t-k} + \sum_{k=0}^{s} \delta'_{1ik} X_{i,t-k} + \mu_{1i} + \varepsilon_{1it} \qquad (3)$$

where igi_{it} denotes inclusive growth index, X_{it} is a $n \times 1$ explanatory variables'' vector, δ_{ik} is a $n \times 1$vector of coefficients, α_{ik} are scalars while μ_i is the country-specific effect. Equation (3) is further reparametrised into the error correction equation to capture the short-run dynamics as well as the deviation from the equilibrium state, simultaneously.

$$\Delta igi_{it} = \sum_{k=1}^{r1} \alpha^*_{ik} igi_{i,t-k} + \sum_{k=0}^{s-1} \delta'^*_{ik} \Delta X_{i,t-k} + \gamma_{1i} \left(igi_{i,t-1} - \lambda'_i X_{it} \right) + \mu_i + \varepsilon_{it} \qquad (4)$$

The error correction term parameter is $\gamma_i = -\left(1 - \sum_{j=1}^{r} \alpha_{ij}\right)$ establishing any long-run equilibrium nexus, while $\lambda_i = \sum_{k=0}^{s} \delta_{ik} \Big/ \left(1 - \sum_{l} \alpha_{il}\right)$ captures the long-run estimates; and $\alpha^*_{ik} = -\sum_{v=k+1}^{r} \alpha_{iv}$ $\left(k = 1, \ldots, r-1\right)$; and $\delta^*_{ik} = -\sum_{v=k+1}^{s} \delta_{iv}$ $\left(k = 1, \ldots, s-1\right)$ are the short-run estimates. The vectors of explanatory variables in the study include the labour force participation rate (LFP), trade openness (TO) and the quality of institutions captured using control of corruption (CC) and rule of law (RL), life expectancy at birth (LEB), public expenditure on health (PEH) and the gross capital formation (GFCF) in the SSA countries.

3.2 Data and Source

The study used panel data for 20 sub-Saharan African countries for the period of 22 years from 2000 to 2021. The data include the inclusive growth index as a proxy for inclusive growth, while life expectancy at birth, public expenditure on health, gross capital formation, labour force participation rate, trade openness, control of corruption and rule of law are the independent variables. The inclusive growth index was computed using the Gini coefficient and the GDP per capita by employing the principal component analysis. Data for the study was obtained from the WDI (2023) and the World Governance Indicators (2022). The 20 selected SSA countries are Burundi, Cameroon, Chad, Ethiopia, Gambia, Ghana, Kenya, Lesotho,

Madagascar, Mali, Mauritius, Mozambique, Niger, Nigeria, Tanzania, Uganda, South Africa, Congo Democratic Republic, Senegal and Congo.

4 RESULTS AND DISCUSSION

4.1 Panel Unit Root Analysis

The panel unit root presented in Table II was conducted for the model's variables as a pre-requisite for choosing an empirical model involving large N and T panels. We consider both the stationarity test (see Hadri, 2000) and the nonstationary tests (see Harris & Tzavalis, 1999; Breitung, 2000; Levin, Lin and Chu, 2002; Im, Pesaran and Shin, 1997). Table I reveals that all the unit root test results are mixed – [I(0) and I(1)]. Since the underlying framework for estimation allows for the combination of both I(0) and I(1), in so far as the level of stationarity does not exceed I(1); thus, the mixed order of integration for certain variables in the model is not expected for a bias estimates.

Table 1: Panel unit root tests

Test Method	Igi	Gfcf	lfpr	to	cc	rl	leb	peh
Null hypothesis: unit root with common process								
Harris-Tzavalis [rho]	-41.97***[b]	-24.81***[a]	-32.34***[b]	-9.144***[a]	-2.08**[a]	-2.93***[a]	-5.49***[b]	-3.90***[a]
Breitung [t-stat.]	-8.71***[b]	-7.45***[a]	-9.47***[b]	-2.35***[a]	-9.03***[b]	-7.43***[b]	-3.98***[b]	-10.37***[b]
LLC [t*]	-10.69**[b]	-5.67***[a]	-3.41***[a]	-2.51***[b]	-2.29**[a]	-2.12**[a]	-9.40***[a]	-2.04**[a]
Null Hypothesis: Unit Root with Individual process								
IPS (*W Stat*)	-13.20***[b]	-9.30***[a]	-8.53***[b]	-2.63***[a]	-1.33*[a]	-2.35***[a]	-3.20***[b]	-1.64*[a]
Null hypothesis: No unit root with common unit root process								
Hadri [Z-stat.]	-3.51[a]	1.22[a]	-0.35[b]	-0.87[b]	-0.84[b]	-1.41[b]	36.51***	-3.11[a]
Number of Cross-Sections	20	20	20	20	20	20	20	20
Number of Periods	22	22	22	22	22	22	22	22
Total Number of Observations	440	440	440	440	440	440	440	440

Source: Authors' work

Note: *a* and *b denote* stationarity at level and first difference, respectively, while ***, **,* indicate statistical significance at 1%, 5%, and 10%, respectively.

Table 2: Panel Autoregressive Distributed Lag (PARDL) Model results

Variables	**MG**	**PMG**
δ^{gfcf}	0.0287***	0.0239***
	(0.009)	(0.0070)
δ^{lfpr}	0.0660	0.476
	(0.288)	(0.500)
δ^{to}	-0.00567	0.0051
	(0.0201)	(0.0071)

δ^{cc}	0.396	0.171
	(1.415)	(1.175)
δ^{rl}	-0.0166	-0.239
	(1.206)	(0.764)
δ^{leb}	0.108	0.753**
	(0.406)	(0.304)
δ^{peh}	-1.991*	-0.524*
	(0.0295)	(0.299)
Constant	20.01	13.36***
	(39.14)	(1.367)
λ^{gfcf}	0.0324**	0.010***
	(0.0133)	(0.0029)
λ^{lfpr}	-0.650	0.108***
	(0.646)	(0.0408)
λ^{to}	0.205	0.0198***
	(0.148)	(0.0040)
λ^{cc}	-1.650	0.368
	(5.390)	(0.333)
λ^{rl}	3.237	0.837***
	(5.181)	(0.299)
λ^{leb}	0.366	-0.0096
	(0.352)	(0.0190)
λ^{peh}	-14.55	-0.507***
	(13.91)	(0.146)
γ^{ect}	-0.794***	-0.710***
	(0.0993)	(0.0835)
Hausman Test (X_k^2)		6.06
		(0.5331)
N	20	20
Observation (NT)	420	420

Source: Authors' work

Note: The values in parentheses are the standard errors. The $\delta s'$ are for the short run while the $\lambda s'$ are for the long run. ***, ** & * imply significance at the 1%, 5% and 10% levels, respectively

The results from the PMG estimation reveal significant short- and long-run relationships between key economic and institutional variables and inclusive growth, as measured by the Inclusive Growth Index (IGI). Inclusive growth is a multifaceted concept that involves the expansion of economic opportunities and the equitable distribution of the benefits of economic growth. By examining both short-run and long-run effects, the findings underscore the complex interplay between investment, human capital, trade, public health expenditure, and governance in fostering inclusive growth.

In the short run, gross capital formation emerges as a significant driver of inclusive growth suggesting that an increase in capital investment leads to a relatively immediate positive effect on inclusive growth. The result aligns with the broader empirical literature, which highlights that physical capital investment is crucial for expanding economic opportunities and fostering growth that benefits a broad segment of society. Investment in infrastructure, technology, and industry boosts productivity, creates jobs, and can lead to reductions in income inequality, which is essential for inclusive growth (Barro, 1991; Aghion et al., 2011). Likewise, Life expectancy at birth also has a positive and statistically significant effect in the short run,

suggesting that improvements in public health outcomes, particularly longevity, are associated with an increase in inclusive growth. This result is consistent with studies that emphasize the relationship between health and economic development. For instance, Bloom and Canning (2000) argue that improvements in health outcomes, particularly life expectancy, contribute to a healthier, more productive workforce, which in turn drives inclusive economic growth. Additionally, increased life expectancy is often associated with reductions in poverty and inequality, further supporting the inclusive nature of growth (Bloom et al., 2004).

However, the effect of public health expenditure on inclusive growth in the short run is negative, indicating that, despite increased spending on public health, the immediate impact on inclusive growth may not be positive. This could reflect inefficiencies in how public health resources are allocated or managed. As Gupta et al. (2004) note, the effectiveness of public health expenditure depends not only on the level of spending but also on the quality of governance, institutional structures, and the targeting of health interventions. In some cases, public health spending might be misallocated or poorly managed, resulting in a less-than-expected improvement in health outcomes and economic inclusivity. The labour force participation rate and trade openness do not significantly impact inclusive growth in the short run, suggesting that changes in these variables do not have an immediate effect on inclusive growth, possibly because their impacts may take longer to materialize. While increasing the labour force participation rate can ultimately drive inclusive growth by increasing the supply of labour and enhancing productivity, the short-run impact might be less pronounced due to labour market frictions or delayed responses to policy changes. Similarly, while trade openness is often associated with higher economic growth, its immediate impact on inclusivity may be muted, particularly if the benefits of trade are not evenly distributed or if there are barriers to entry for certain segments of the population (Dollar & Kraay, 2004; Emeka et al., 2024; Li et al., 2024).

In the long run, gross capital formation continues to play a key role, albeit with a smaller magnitude. This finding suggests that capital investment remains a critical factor in sustaining inclusive growth over time. Long-term investments in infrastructure, education, and technology can generate persistent improvements in productivity, reduce inequalities, and expand access to economic opportunities. The importance of capital formation in long-run growth has been widely recognized in the literature. For example, Sachs et al. (2004) argue that sustained investment in capital is essential for countries to achieve inclusive growth, as it creates the foundation for economic expansion and reduces disparities in wealth and opportunity. The labour force participation rate becomes statistically significant in the long run. This result highlights the importance of expanding economic participation by encouraging higher rates of employment, particularly among underrepresented groups such as women and youth. Studies have shown that increasing labour force participation can have a substantial impact on economic growth and inclusivity (Kabeer, 2015). By fostering greater participation, countries can reduce inequality and promote shared prosperity, as a larger proportion of the population has access to economic opportunities. Trade openness also has a significant long-run effect on inclusive growth, underscoring the role of international trade in promoting economic growth and inclusivity. Trade openness allows countries to access new markets, boost competitiveness, and attract foreign direct investment, all of which can contribute to economic growth that is more widely shared. Bello et al. (2024), Dollar and Kraay (2004), Nam et al. (2024) have shown that trade liberalization can lead to faster growth and poverty reduction, particularly when accompanied by policies that ensure the benefits of trade are distributed across society.

In contrast, life expectancy at birth does not have a significant long-run effect on inclusive growth. This result suggests that, while improvements in health may have an immediate impact on inclusivity, their long-term effect might be more complex and mediated by other factors such as income distribution, quality of healthcare systems, and education. This finding contrasts with Bloom et al. (2004), who argue that health improvements have long-term benefits for economic growth by reducing mortality rates and improving human capital, but may require longer periods to fully materialize. The long-run negative effect of public health expenditure on inclusive growth, suggests that inefficient or poorly targeted health spending can undermine inclusive growth. In the long term, increased public health expenditure may not necessarily translate into better health outcomes if the resources are not effectively used. This finding supports the work of Gupta et al. (2004), who emphasize that the effectiveness of public spending is contingent on institutional quality, governance, and policy design. Finally, rule of law shows a robust and positive long-run relationship with inclusive growth. This result emphasizes the critical role of strong institutions in promoting inclusive growth. The rule of law ensures that property rights are protected, contracts are enforced, and economic opportunities are accessible to all members of society. Kaufmann et al. (2009) argue that institutional quality, particularly the rule of law, is a key determinant of inclusive economic growth. Without robust legal institutions, the benefits of economic growth may not be widely shared, leading to greater inequality and social unrest.

The existence of the speed of adjustment back to long-run equilibrium using the error correction term (ECT) is to evaluate the statistical significance of short parameters as observed in the long run. For the error correction term (ECT), the speed of adjustment coefficient is negative and statistically significant as required. The coefficient of -0.710 indicates that about 71.0% of the short-run deviations from the long-run, equilibrium is corrected annually. Alternatively, the adjusted is calculated by taking the inverse of the absolute value of the ECT to show how long it takes for the deviations from equilibrium to return to equilibrium (Pao & Tsai, 2010). Therefore, the adjusted speed for this study is 4 years (i.e., $1/0.710$), which implies that it would take about 1 year and 4 months for short-run deviations from the long-run to be corrected.

The findings of this study contribute to the understanding of the drivers of inclusive growth by emphasizing the roles of capital formation, labour force participation, trade openness, public health expenditure, and governance. In both the short- and long-run, investment in capital, human capital, and strong institutions is essential for fostering inclusive growth. The results highlight the importance of strategic investments in physical and human capital, such as improving health and expanding labour force participation, as well as the need for effective public spending. The negative impact of public health expenditure and the positive impact of the rule of law in the long run suggest that governance quality and the effectiveness of public policies are key factors in ensuring that growth benefits a broad cross-section of society. These findings are consistent with the broader empirical literature on inclusive growth, which stresses the need for comprehensive and well-coordinated policy approaches to ensure that growth is both robust and equitable.

5 CONCLUSION

The study examines the impact of human capital on inclusive growth in 20 SSA countries from 2000-2021 employing the PMG estimators of the PARDL technique in estimating the nexus.
Based on the results of the panel analysis, the rising level of human capital in the selected countries is alarming especially when public health expenditure exhibited a negative nexus in the short- and long-run. Given the negative economic consequences, governments should address this by extending the public health expenditure among the citizens. Such includes the need to increase individuals' earning capacity to raise income and hence, private health

expenditure. The government may also need to increase public health expenditure to meet the prescribed allocation of 15% government budget to the health sector. Similarly, the rising level of corruption in the selected countries should be tackled head-on. The level of corruption, so rampant that public servants see inducements before performing routine functions as a custom, has a severe impact beyond the supposed increased output level. Appropriate policy in this regard requires making integrity and sincerity more attractive, while any act of corruption should be met with severe penalties.

In general, empirical findings in this study suggest policy efforts toward achieving inclusive growth should focus on substantially increasing government spending on health. The policy efforts towards achieving inclusive growth should not focus only on improving the health of the population but also ensure that such citizens have equal opportunities for empowerment and welfare support. Increasing life expectancy should be supported by strengthening the fight towards reducing corruption and upholding the rule of law. Health insurance can be expanded and strengthened to mobilize more resources for the health sector. Capital projects like infrastructures, health facilities, machinery and equipment and manpower training in the health sector should be enhanced to improve the performance of the health sector. These will engender a positive and significant impact of healthcare expenditure on inclusive growth in the selected SSA countries

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